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richness of this locality was again apparent, and we added to our collection a number of species, among these may be mentioned *Liodon ictericus* Cope and a new Clidastes.

The writer originally pointed out the existence of representatives of the orders Pythonomorpha and Sauropterygia, in this Cretaceous basin. Prof. Marsh's explorations determined the existence of Ornithosauria and Crocodilia. The present investigation adds Dinosauria and perhaps Testudinata, or the group the new form Protostega Cope, represents.

The preceding account expresses some points of interest observed. These with others now unnoticed will be included in a final report.

The giants of this sea were the *Liodon proriger* Cope, *L. dyspelor* Cope, *Polycotylus latipinnis* Cope, and *Elasmosaurus platyurus* Cope. Of these the first was apparently the most abundant. The second was the most elongate, exceeding in length perhaps any other known reptile. The last named had the most massive body, and exhibited the most extraordinary appearance in consequence of the great length of its neck.

For kind assistance I am much indebted to Captain Edwin Butler post commandant at Fort Wallace; to Dr. W. H. King post surgeon; and to Captain Wyllys Lyman. To Lieutenant James H. Whitten and Sergeant W. Gardiner who accompanied the expedition much of its success is also due. — EDWARD D. COPE, *Fort Wallace*, *Kansas*, *Oct. 9th*, 1871.

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MICROSCOPY.

AHRENS' BINOCULAR.—This instrument, the fourth new binocular brought forward within a few months, was submitted to the Royal Microscopical Society, of London, on the eighth of February last. It is applicable mainly to high powers, being manifestly unable to compete with Wenham's arrangement for low powers. It naturally stands in comparison with the contrivances of Mr. Tolles and President Barnard. Like Dr. Barnard's, which was published some months previously, it separates the light above the objective into two pencils by double refraction by means of Iceland spar, cut and cemented in a somewhat complicated and difficult manner. In other respects the two instruments are entirely different. In the new arrangement the pencils of light pass upward from the prism at an equal angle on each side of the axis of the instrument, are crossed and at the same time rendered achromatic by wedge-shaped prisms of flint glass placed base to base, and proceed to the two eye-pieces through tubes symmetrically situated in reference to the axis of the instrument, as in Mr. Wenham's early proposals for refracting binoculars. Adjustment for distance of eyes is made, as in Wenham's present arrangement, by a draw-tube movement. In stereoscopic effect, as well as in illumination (only one of the two polarized rays being utilized), the new arrangement is no doubt inferior to Tolles' binocular eye-piece, but it possesses the great advantage of enabling the eyes to look at the object, through the convergent tubes, at the natural angle of near vision. It may be made in the form of an eye-piece applicable to any large stand; or, more satisfactorily, as a supplementary compound body capable of being easily fitted to any stand of suitable size, and of being used interchangeably with the regular body belonging to the stand.— R. H. WARD.

NATURE OF CILIARY MOVEMENT.—Professor Hæckel has made some highly important observations on the nature of ciliary movement, as we find in the "Quarterly Journal of Microscopical Science." Recent investigations by others had shown that physiologically the ciliary is much more nearly related to the amœboid movement than to the muscular. Hæckel shows that the ciliary is merely a modification of the amœboid movement of protoplasm. "Ciliated cells are of two kinds. In the one kind, *Epithelium flagellatum*, each cell is provided with a single long flagellum or lash. Sponges possess only this kind; in the other, *Epithelium ciliatum*, numerous hair-like appendages take the place of the flagellum. This is the kind found in most of the higher animals. The old notion, that in ciliated cells the cilia are attached to the outside of the cell membrane, must now be considered as entirely set aside. Many, probably most, ciliated cells are destitute of a membrane, and the appendages, whether flagella or cilia, are direct processes of the protoplasm of the cell." Prof. Hæckel's observations on lower organisms during the last year have led him to the conclusion that ciliated cells arise directly by the transmutation of amœboid cells.

COMBINATION OF THE SPECTROSCOPE AND POLARISCOPE. — Mr. Francis Deas has introduced to the Royal Society of Edinburgh a very curious department of microscopical study, the details of which are published in the "Monthly Microscopical Journal." He combines the spectroscope with the polarizing microscope, in order to analyze the colors given by double refracting crystals when viewed by polarized light. In his arrangement, the light from the mirror passes first through an adjustable slit below the substage, then through a Nicol's prism and the achromatic condenser, and forms an image of the slit on the double refracting crystal on the stage. The dispersion prisms are placed above the objective, and the spectrum is viewed with the eye-piece and analyzing prism. Those who prefer to use the spectroscopic eye-piece, as most do in this country, would dispense with the slit below the substage, and place the analyzing prism over the objective.

A High One-fifth. — Assist. Surg. J. J. Woodward, U. S. A., resolves *Amphipleura pellucida* with a Tolles' immersion one-fifth. This is a high one-fifth, but much less than a one-sixth in power. Angular aperture 110° to 170° according to adjustment. As these lines count ninety-six thousand to the inch, Dr. Woodward expected that it might resolve the sixteenth band of Nobert's plate. He only succeeded, however, in getting through the fifteenth band. This result corresponds with his judgment, based upon other observations, that Nobert's lines are more difficult of resolution than lines of equal fineness on the natural objects usually studied in comparison with them.

Fresh-water Algæ. — Dr. T. C. Hilgard's paper on this subject, read before the Microscopical Section of the American Association at the Indianapolis meeting, was inadvertently omitted from the list of papers published in the Association Number of the Naturalist.

Photographing Histological Preparations. — Dr. Woodward describes in the "American Journal of Science and Arts" for October certain improved methods of using the light of the sun for photographing the soft tissues.

Nobert's Lines.—President Barnard judges that it is not necessary to count the whole of one of Nobert's bands in order to resolve it unmistakably, but only to count a measured portion of a band.

Stanistreet's Lines. — John F. Stanistreet, Esq., of Liverpool, has ruled some stars on glass and steel, the rays of which, some fifty in number, consist of bands of parallel lines two thousand to the inch. The intersection of these different lines gives very curious and beautiful optical effects under the microscope.

Microscopy in Paris. — We learn from the "Quarterly Journal of Microscopical Science" that Hartnack is back at Paris, just as he was before the war. He is about to establish works at Potsdam.

NOTES.

"A very large audience, consisting of the teachers in Boston, assembled early in November, in the new hall of the Massachusetts Institute of Technology to attend the opening of a series of lectures upon Methods of Instruction in Natural History.

As it was the first time this hall had been publicly used, Professor Runkle, President of the Massachusetts Institute of Technology, opened the proceedings and introduced, in a few appropriate words of welcome, Mr. Thomas T. Bouvé, President of the Boston Society of Natural History.

Mr. Bouvé stated that the society which he represented had for many years by its publications and meetings, but more especially by the display of natural objects in its Museum, appealed to the public mind and endeavored to cultivate a taste for science in the community. The Teachers' School of Science was a very appropriate supplement to the other operations of the society and had been in contemplation by several officers of the society for some time past. The present active beginning, however, was due to the generosity of one of these gentlemen who had furnished the pecuniary means for making the necessary collections and paying the lecturers. The enterprise, however, was considered as an experiment to be worked out rather than talked about, and he would therefore without further delay introduce Prof. W. H. Niles, who would deliver the first course on 'Physical Geography.'

Prof. Niles made a few preliminary remarks upon the necessity of teaching science in the schools in a practical manner, and showed that the projectors of the enterprise had no intention of forcing theories upon the minds of the teachers. They simply wished to help, to join with them in their efforts to educate the young, and to place before them such information as their special acquirements in different branches of knowledge would justify.